Professional Shop Manual

“A” and “B” Series Mowers

NOTE: These materials are for use by trained technicians who are experienced in the service and repair of outdoor power equipment of the kind described in this publication, and are not intended for use by untrained or inexperienced individuals. These materials are intended to provide supplemental information to assist the trained technician. Untrained or inexperienced individuals should seek the assistance of an experienced and trained professional. Read, understand, and follow all instructions and use common sense when working on power equipment. This includes the contents of the product’s Operators Manual, supplied with the equipment. No liability can be accepted for any inaccuracies or omission in this publication, although care has been taken to make it as complete and accurate as possible at the time of publication. However, due to the variety of outdoor power equipment and continuing product changes that occur over time, updates will be made to these instructions from time to time. Therefore, it may be necessary to obtain the latest materials before servicing or repairing a product. The company reserves the right to make changes at any time to this publication without prior notice and without incurring an obligation to make such changes to previously published versions. Instructions, photographs and illustrations used in this publication are for reference use only and may not depict actual model and component parts.

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MTD Products Inc - Product Training and Education Department

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CHAPTER 1: INTRODUCTION

Professional Service Manual Intent: This manual is intended to provide service dealers with repair and overhaul procedures for the “A” and “B” series mowers.

Disclaimer: The information contained in this manual is correct at the time of writing. Both the product and the information about the product are subject to change without notice.

About the text format

Certain flags and key words are used to indicate the nature of the text that accompanies them. They are as follows:

CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in death of serious injury.

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

NOTE: “NOTE” is used to point-out helpful information that may not fit as a step in a procedure.

1. Numbered steps indicate specific things that should be done, and the order in which they should be done.

   1a. Sub steps will be lettered and nested within steps. Two or more sub steps may be combined to describe the actions required to complete a step.

- **Bullet points**: Indicate sub-steps or points of interest, without implying order or relative importance.

Disclaimer: This manual is intended for use by trained, professional technicians.

- Common sense in operation and safety is assumed.
- In no event shall MTD be liable for poor text interpretation, or poor execution of the procedures described in the text.
- If the person using this manual is uncomfortable with any procedures they encounter, they should seek the help of a qualified technician.

Safety

This Service Manual is meant to be used along with the Operator's Manual. Read the Operator's Manual and familiarize yourself with the safety and operational instructions for the equipment being worked on. Keep a copy of the Operator's Manual for quick reference. Operator's manuals may be viewed for free at the brand support website. It will be necessary to have the complete model and serial number for the equipment.

⚠CAUTION

- Be prepared in case of emergency:

  Keep a fire extinguisher nearby

  Keep a first aid kit nearby

  Keep emergency contact numbers handy
- Replace any missing or damaged safety labels on shop equipment.
- Replace any missing or damaged safety labels on equipment being serviced.

⚠WARNING

- Grooming and attire:

  Do not wear loose fitting clothing that may become entangled in equipment.

  Long hair should be secured to prevent entanglement in equipment.

  Jewelry is best removed.
- Protective gear: includes, but is not limited to

  Clear eye protection_____while working around any machinery

  Protective gloves_____where necessary

  Armored footwear_____when working around any machinery

  Hearing protection_____in noisy environments

  Chemically resistant gloves_____when working with chemicals or solvents

  Respirator_____when working with chemical or solvents

  Appropriate tinted eye protection_____when cutting or welding

⚠CAUTION

- Remember that some hazards have a cumulative effect. A single exposure may cause little or no harm, but continual or repeated exposure may cause very serious harm.
- Clean spills and fix obviously dangerous conditions as soon as they are noticed.
- Lift and support heavy objects safely and securely.
- Be aware of your surroundings and potential hazards that are inherent to all power equipment. All the labels in the world cannot protect a technician from an instant of carelessness.

⚠ DANGER

Exhaust fumes from running engines contain carbon monoxide (CO). Carbon monoxide is a colorless odorless gas that is fatal if inhaled in sufficient quantity. Only run engines in well ventilated areas. If running engines indoors, use an exhaust evacuation system with adequate make-up air ventilated into the shop.

Fasteners

- The fasteners used on the equipment described in this manual, and the engine that powers it are a combination of metric and fractional inch. For this reason, wrench sizes are frequently identified in the text, and measurements are given in U.S. and metric scales.
- If a fastener has a locking feature that has worn, replace the fastener or apply a small amount of releasable thread locking compound such as Loctite® 242 (blue).
- Some fasteners like cotter pins are single-use items that are not to be reused. Other fasteners such as lock washers, retaining rings, and internal cotter pins (hairpin clips) may be reused if they do not show signs of wear or damage. This manual leaves that decision to the judgement of the technician.

Assembly instructions

- **Torque specifications** may be noted in the part of the text that covers assembly. They may be summarized in tables along with special instructions regarding locking or lubrication. Whichever method is more appropriate will be used. In many cases, both will be used so that the manual is handy as a quick-reference guide as well as a step-by-step procedure guide that does not require the user to hunt for information.
- **Lubricant** quantity and specification may be noted in the part of the text that covers maintenance, and again in the section that covers assembly. They may also be summarized in tables along with special instructions. Whichever method is more appropriate will be used. In many cases, the information will be found in several places in the manual so that the manual is handy as a quick-reference guide as well as a step-by-step procedure guide that does not require the user to hunt for information.
- The level of assembly instructions provided will be determined by the complexity of reassembly, and by the potential for damage or unsafe conditions to arise from mistakes made in assembly.
- Some instructions may refer to other parts of the manual for subsidiary procedures. This avoids repeating the same procedure two or three times in the manual.

A and B series mowers

The “A” series mower

The “A” series mower is a 21” platform introduced for the 2010 season. The “A” series is produced in a variety of configurations.

- A push version.
- A front wheel drive single speed version.
- A front wheel drive variable speed version
- A side discharge and mulch version.
- A rear discharge and mulch version.
- A rear discharge, side discharge and mulch version.
- Dual point height adjusters.
- 7” front wheels and 8” rear wheels

Figure 1.1

The “B” series mower

The “B” series mower is a high wheel version of the “A” series mower. It has 11” rear wheels and is made in the same variety of configurations as the “A” series.
See Figure 1.2.

Figure 1.2

These mowers are built in a variety of brands. Identify the mower by the 11-digit model number and the serial number when ordering parts.

NOTE: Use only the correct OEM parts when making repairs to the mower or its engine.

Understanding model and serial numbers

A sample model number of an “A” series mower is 12A-A26M011.

The break down of what the model number means is as follows:

- 12 . . . . . indicates that this is a self propelled mower
- . . .A . . . . . indicates the sales revision
- . . . . . “-” . . . . . indicates the starter and wheel drive
- . . . . . A . . . . . indicates the series
- . . . . . 2 . . . . . indicates the type of discharge (0 = mulch/side discharge, 1 = mulch/rear discharge, 2 = 3-in-1 mower).
- . . . . . 6M. . . . . indicates the engine
- . . . . . 011 . indicates the retailer

The serial number is 1J059P10005. The serial number reads as follows:

- 1 . . . . . engineering level
- . J . . . . . month of production (J = October)
- . . 05 . . . . . day of the month
- . . . . .9. . . . . last digit of the year
- . . . . . P . . . . . plant it was built in
- . . . . . 1 . . . . . assembly line number
- . . . . . 0005 . . . . . number of unit built

Additional technical and service information may also be available to our company authorized service center personnel through our company corporate offices, regional parts distributors and regional service center field support personnel. Please contact the designated support office in your area or our corporate offices directly should further service information be needed.

MTD Products LLC

P.O. Box 368022

Cleveland, OH 44136

Telephone: (800) 800-7310

www.mtdproducts.com

A and B series mowers

Maintenance chart

Maintenance item	Each use	Each 25 hrs. use	Each 50 hrs. use
Check engine oil	*		
Check air filter	*		
Check for loose/bent blade	*		
Check & gap spark plug	Replace if worn		*
Check cooling fins	After prolonged storage		
Check/clean spark arrestor		*	
Change oil		*	
Note on oil:	Change oil after first 5 hrs of use and before prolonged storage		
Change air filter		*	
Note on air filter	Air filter and pre-filter life vary dramatically with operating conditions		
Drain or preserve fuel	Before prolonged storage		
Fog or lube cylinder	Before prolonged storage		
Rotate engine to TDC	Before prolonged storage		

NOTE: Refer to the engine manufacturer's manual for complete engine service information. MTD engines are covered by form #769-03354A.

CHAPTER 2: BLADE AND BELT

Blades

The condition of the blades will greatly effect the quality of the cut.

The blades should be sharpened and balanced after every hour of cutting, depending on local conditions. A dull blade tears the grass instead of cutting it. Torn grass blades leaves a rough look and makes the grass vulnerable to diseases.

Blades need to be examined for damage before sharpening. Blades must be balanced after sharpening to reduce the vibrations felt from the deck.

Bent blades are a sign of a blade impact. The blades must be replaced and the engine inspected for a bent crankshaft if a bent blade is found.

Blades come in a variety of styles; side discharge, mulching, bagging, combination, there are even de-thatching blades on the market. The A and B Series mowers come equipped with a 3-in-1 blade from the factory. The outer part of the leading edge cuts the grass. A wing on the back edge lifts the grass for the next blade and propels clippings toward the bag or side discharge chute if the path to either is open. A stepped-up cutting edge just in-board of the outer cutting edge mulches clippings as they fall, if the side and/or rear discharge chute(s) are closed and the mulch plug is in place.

The air flow in the cutting deck is generated by the spinning blades. If the blades are mounted upside down, the air flow will be reversed pushing the grass down instead of standing up.

NOTE: Blades that are mounted upside down, increase the risk of impacting an object.

⚠CAUTION An incorrect or improperly mounted blade can crate a thrown object hazard.

Blade removal

To remove the cutting blade:

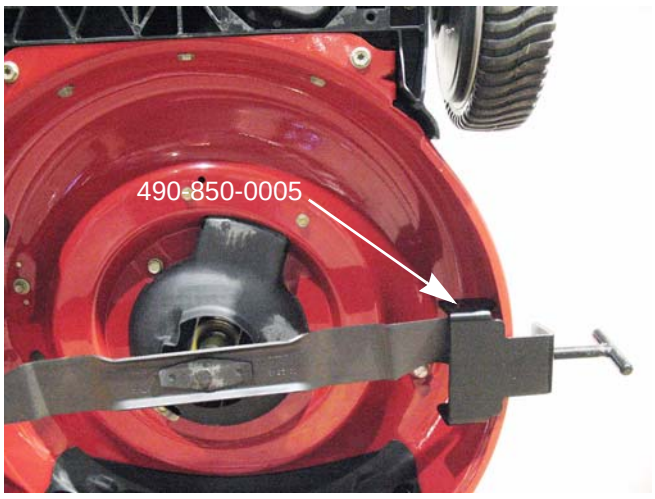

Figure 2.1

⚠WARNING

Allow the engine to cool.

Disconnect and ground the spark plug wire.

Drain the fuel into an approved container.

1. Tip the mower with the muffler side down, or tilt the mower back on a work bench, with the front wheels up. See Figure 2.1.
2. Block the blade from rotating using a block of wood or a blade holder tool.

NOTE: MTD blade holding tool, part number 490-850-0005, can be used block the blade. See Figure 2.1.

3. Remove the blade bolt and diamond-shaped Belleville blade spring using a 5/8” wrench.

> **⚠CAUTION** Use care around the blade while removing or tightening the bolt. The blade can spin and cause injury.

4. Lift away the blade. See Figure 2.2.
5. Inspect the blade. If it is bent or worn beyond proper sharpening, replace it with a new blade.
6. Sharpen and balance the blade if it is not badly worn.
7. Check the blade adapter, crankshaft and hardware for damage.
8. Install the blade with the blade adapter and Belleville spring washer properly positioned. Tighten the blade bolt to a torque of 38-50 ft.-lb. (51-68 Nm).

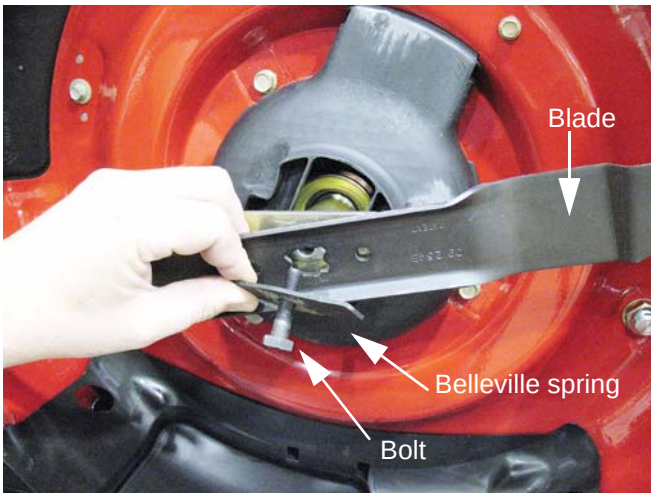

Figure 2.2

NOTE: OEM blades manufactured by MTD are stamped with the part number and the word “BOTTOM”. The word bottom should face the ground when the mower is in its normal operating position. See Figure 2.3.

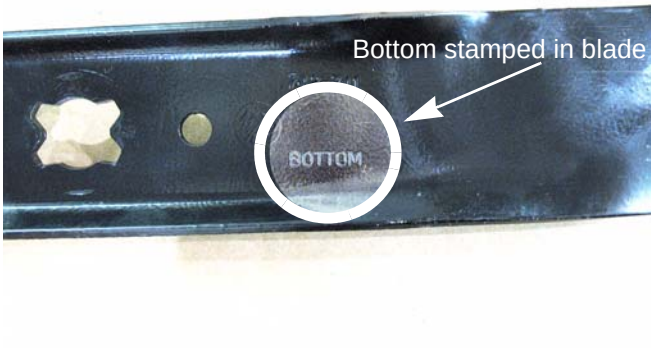

Figure 2.3

Blade sharpening

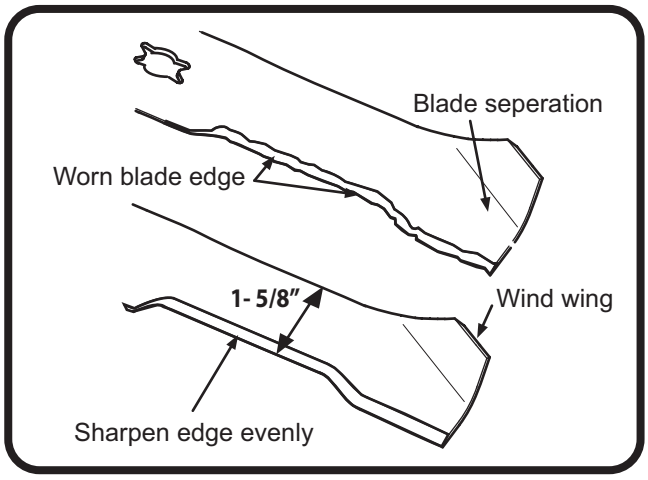

Figure 2.4

- To properly sharpen the cutting blades, remove equal amounts of metal from both ends of the blades along the cutting edges, parallel to the trailing edge, at a 29° to 32° angle.

IMPORTANT: If the cutting edge of the blade has already been sharpened to within 1 5/8" from the back edge at the smallest point, or if any metal separation is present, replace the blades with new ones. See Figure 2.4.

- It is important that each cutting blade edge be ground equally to maintain proper blade balance.
- The blade can be tested by using a blade balancer. Grind metal from the heavy side until it balances evenly.

Figure 2.5

⚠CAUTION A poorly balanced blade will cause excessive vibration and may cause damage to the mower and result in personal injury.

NOTE: MTD blade balancer AR-SBB-102 or the blade balancing kit, AR-BSK-1 can be used to balance the blade. See Figure 2.5.

Belt removal/replacement

The single speed and the variable speed mowers use the same transmission. When the drive control bail is operated, it pulls on the drive cable. As the drive cable starts to pull the clutch lever on the transmission, it engages the clutch. As the cable continues to pull, it tilts the transmission to put tension on the drive belt. On the single speed version, it is one solid pull that fully engages the drive belt. On the variable speed version, the amount of tension is controlled by how much the cable is pulled.

To remove/replace the belt:

1. Remove the blade by following the steps described in the blade section of this chapter.

   NOTE: Keep the mower on its side.

2. Remove the engine mounting screw that secures the engine baffle using a 1/2” wrench. See Figure 2.6.

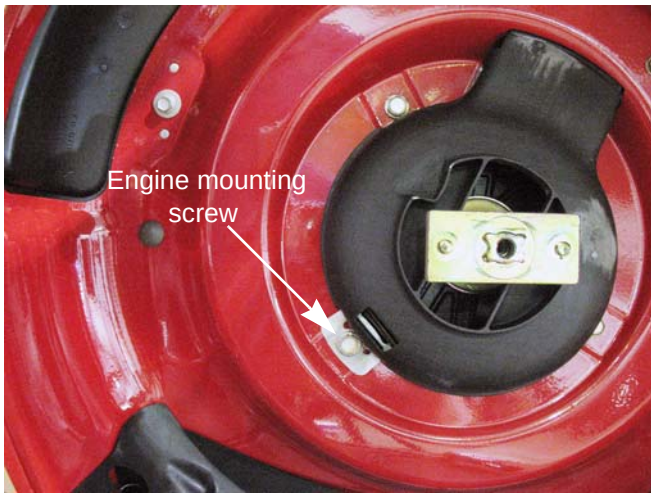

Figure 2.6

3. Slide the neck of the baffle out of the deck opening.
4. Rotate the baffle until the opening in it lines up with the blade adapter. See Figure 2.7.
5. Remove the baffle.
6. Remove the blade adapter while slipping the belt off of the pulley.

   NOTE: There may or may not be washers and/or a spacer above the blade adapter, depending on the engine installed on the mower. If there are, note the order they came off so they can be installed the same way.

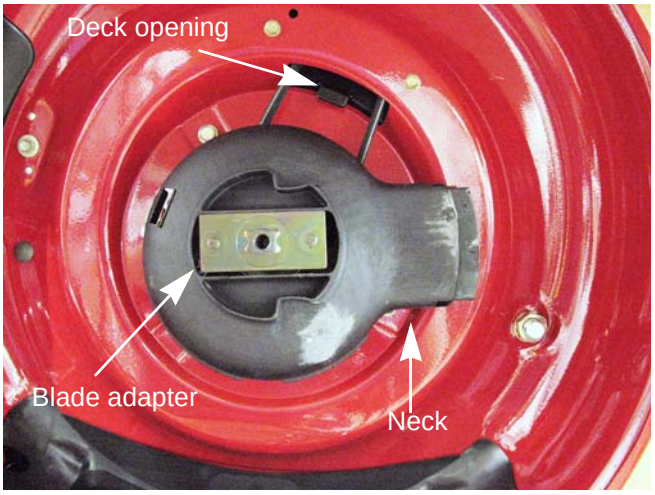

Figure 2.7

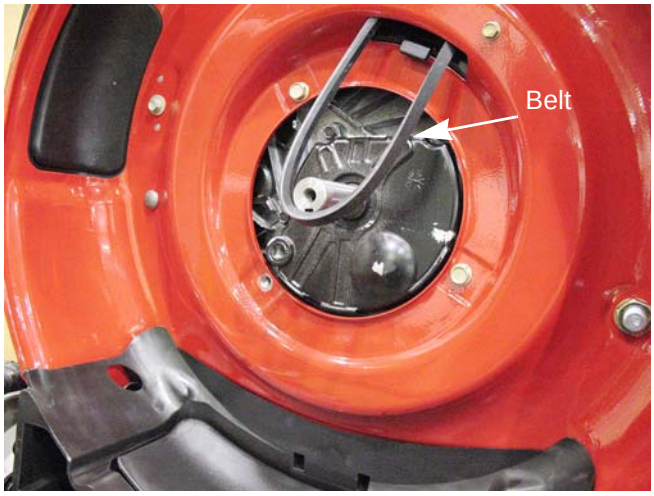

Figure 2.8

7. Slip the belt over the crank shaft. See Figure 2.8.

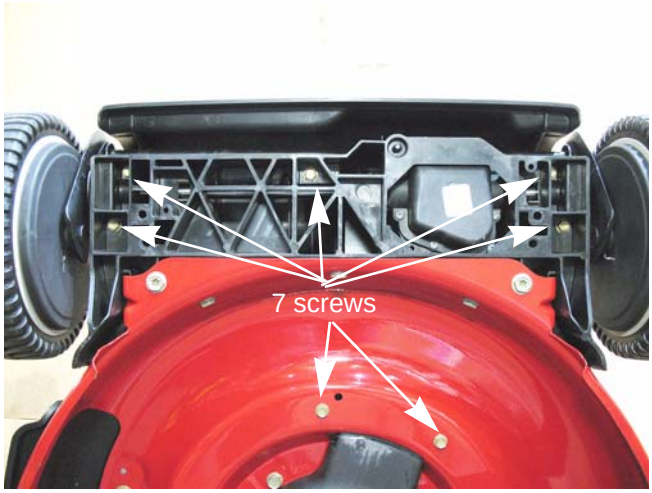

Figure 2.9

8. Remove the seven screws that hold the transmission cover to the mower. See Figure 2.9.

Figure 2.10

9. Remove both front wheels.
10. Remove the two screws on each side that holds the belt cover to the front sub frame. See Figure 2.10.
11. Remove the transmission cover.

12. Unhook the wire form belt guide from the post on the transmission.
13. Lift the belt guide off of the transmission.
14. Remove the belt.
15. Install a new belt by following the previous steps in reverse order.
16. Test run the mower in a safe area before returning it to service.

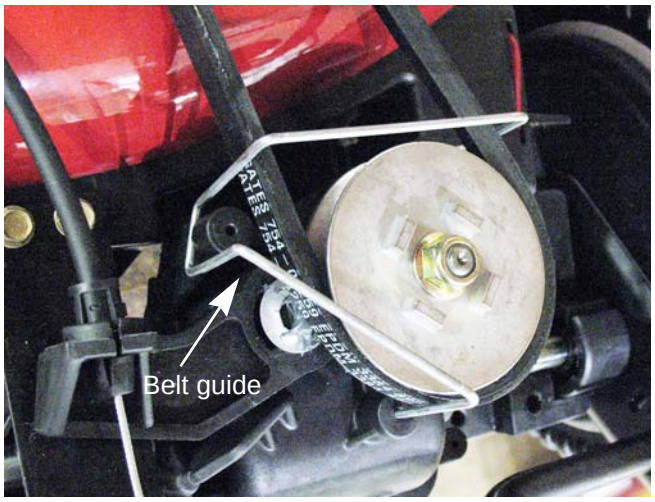

Figure 2.11

CHAPTER 3: CABLES

Engine Control Cable

The engine control cable operates the engine brake. When the bail is pulled against the handle bar, the engine control cable pulls the engine brake pad away from the flywheel releasing the brake. The engine brake has an ignition switch built into it. When the brake is engaged, the ignition switch shorts the ignition module to ground. This turns off the ignition, stopping the engine.

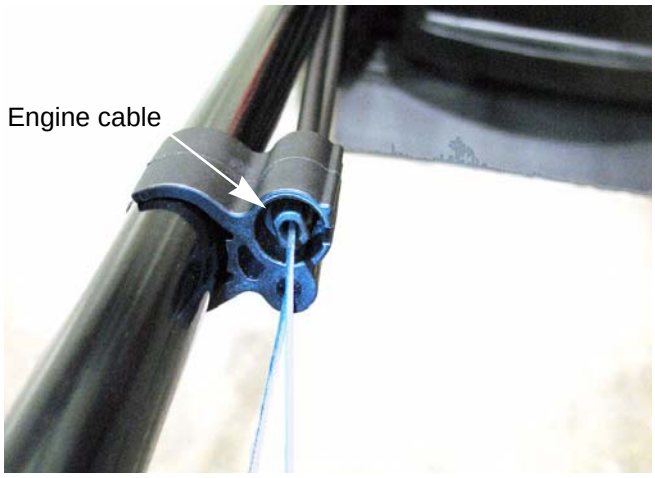

Figure 3.1

To remove/replace the engine control cable:

1. Make sure the engine is off and cool enough to safely work around.
2. Squeeze the tabs on cable jacket (on the bail end of the cable) together using a pair of pliers or a ford fuel line disconnect tool. Push the cable through the bracket. See Figure 3.1.
3. Unhook the Z-fitting from the safety bail.

NOTE: On the single speed models, the cable bracket is part of the drive control cable.

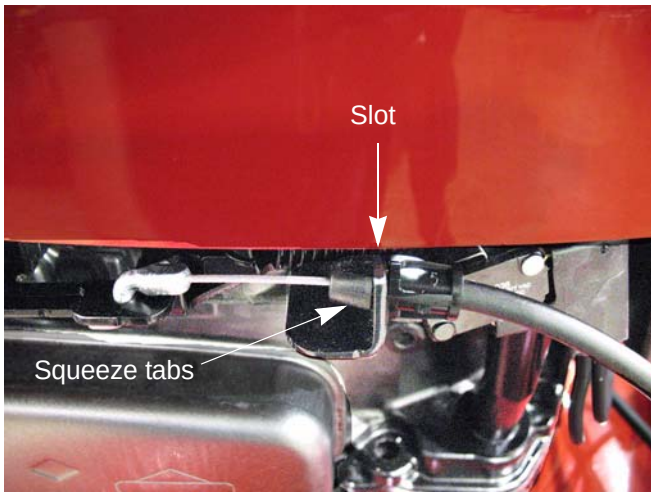

Figure 3.2

4. Use a pair of pliers, or a ford fuel line disconnect tool, to squeeze the tabs. Push the cable jacket through the bracket until the inner cable lines up with the slot on the bracket. See Figure 3.2.

NOTE: Ford fuel line tools cause less damage to the barbed fittings. See Figure 3.3.

Figure 3.3

5. Slide the inner cable through the slot. See Figure 3.4.
6. Unhook the Z-fitting from the blade brake and discard the old cable.
7. Install by following the previous steps in reverse order.
8. Test run the mower before returning it to service.

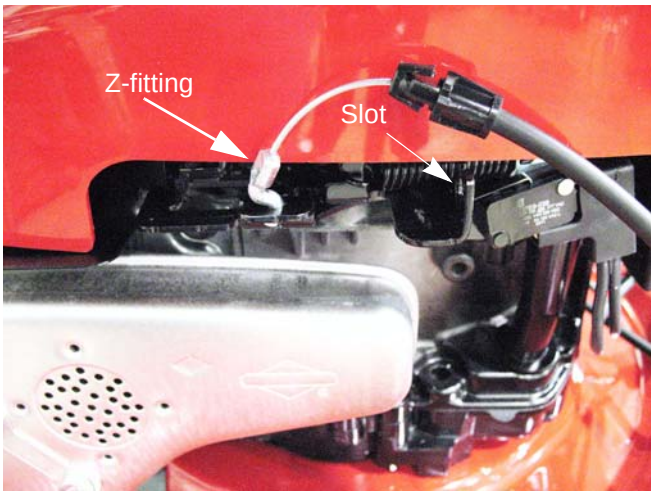

Figure 3.4

Drive Control Cable (variable speed)

To remove/replace the traction control cable:

1. Disconnect the spark plug wire and ground it to an engine bolt.
2. Drain the fuel from the gas tank into an approved container.
3. Remove the belt cover by following the steps described in Chapter 2: Blade and Belt.
4. Set the mower down on a couple of wooden blocks.
5. Remove the transmission cover.
6. Squeeze the tabs together on the cable jacket, using a pair of pliers or a ford fuel line disconnect tool, and push it through the clutch lever. See Figure 3.5.

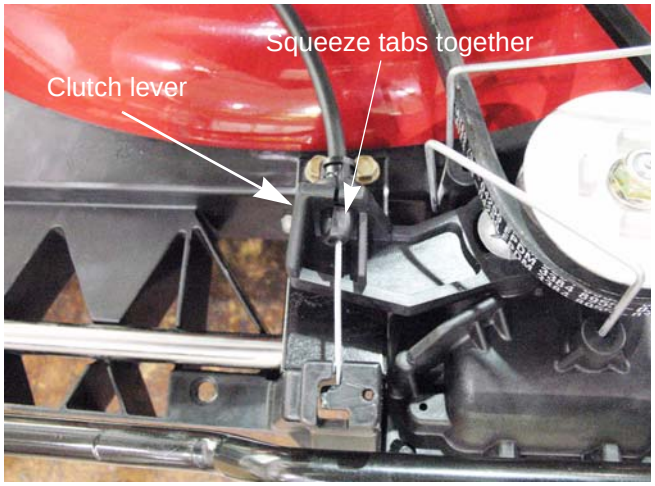

Figure 3.5

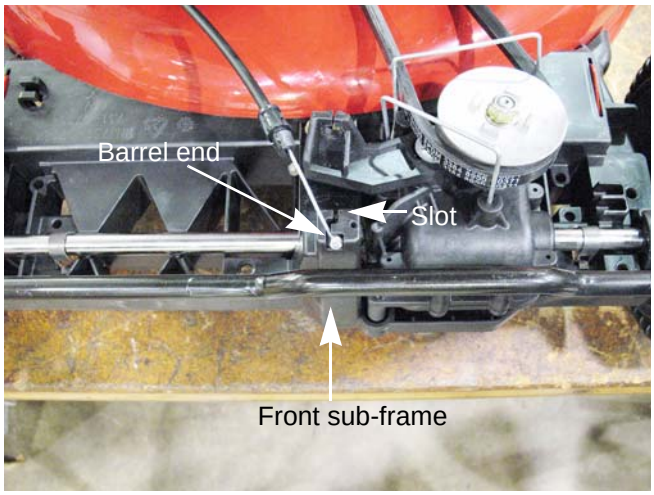

Figure 3.6

7. Work the barrel end of the cable out of the slot on the front sub-frame.

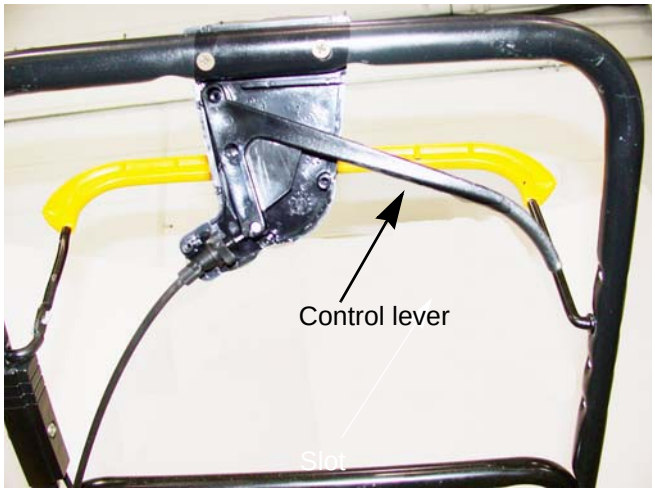

Figure 3.7

8. Remove the four screws that fasten the lower handle cover to the upper handle cover.
9. Disconnect the barrel end of the cable. Align the cable with the slot on the control lever and slide it out. See Figure 3.7.
10. Slide cable out of the cable ties on the handle bar and discard.

NOTE: If the control lever shows signs of damage or wear, replace it.

11. Install the cable by following the previous steps in reverse order.
12. Test run the mower in a safe area before returning it to service.

Drive cable adjustment (variable speed)

To adjust the drive cable:

1. Start the engine.

   NOTE: If the mower starts to drive without touching the drive control lever, the drive cable is too tight.

2. Squeeze the drive control lever.

   NOTE: If the drive speed is too slow, the drive cable can be tightened.

   NOTE: If the drive speed is too fast, the drive cable can be loosened.

3. To adjust the drive control, turn the thumb wheel in the control handle. See Figure 3.8.

4. Adjust the cable so that:

   - The wheels drive with sufficient force when the handle is squeezed.
   - It takes reasonable effort to squeeze the lever.
   - The wheels disengage completely when handle is released.

Figure 3.8

Drive Control Cable (single speed)

To remove/replace the traction control cable:

Figure 3.9

1. Disconnect the spark plug wire and ground it to an engine bolt.
2. Drain the fuel from the gas tank into an approved container.
3. Tip the mower up to gain access to the underside of the deck.
4. Remove the belt cover by following the steps described in Chapter 2: Blade and Belt.
5. Set the mower down on a couple of wooden blocks.
6. Squeeze the tabs together on the cable jacket, using a pair of pliers or a ford fuel line disconnect tool, and push it through the clutch lever. See Figure 3.9.

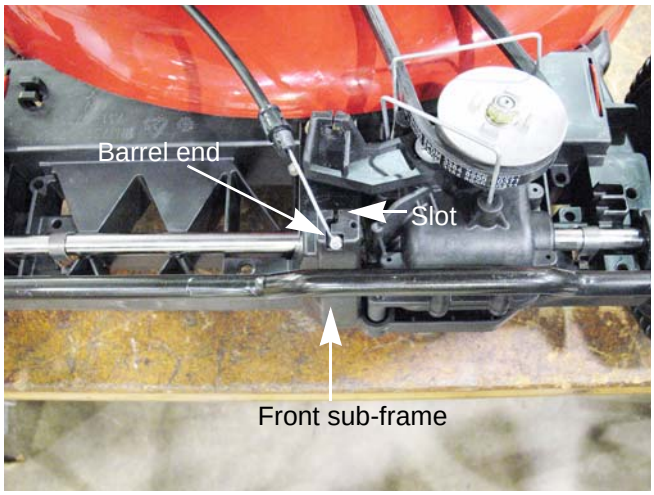

Figure 3.10

7. Work the barrel end of the cable out of the slot on the front sub-frame.

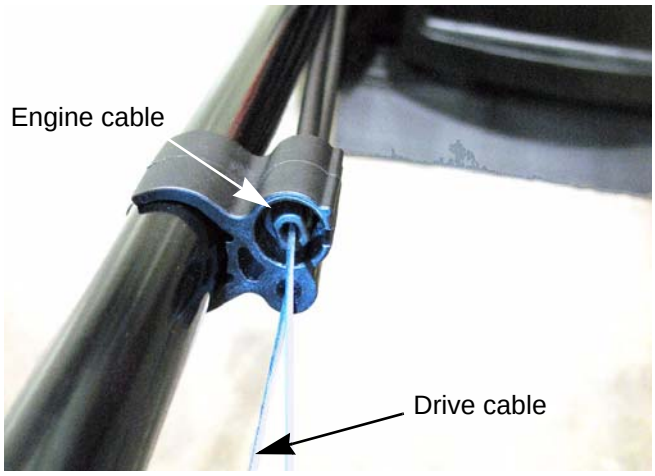

Figure 3.11

8. Disconnect the engine control cable from the handle bar.
   - 8a. Squeeze the tabs on cable jacket (on the bail end of the cable) together using a pair of pliers or a ford fuel line disconnect tool. Push the cable through the bracket. See Figure 3.11.
9. Unhook the Z-fitting from the safety bail.
10. Unsnap the cable mounting bracket from the handle bar.
11. Install the drive cable by following the previous steps in reverse order.
12. Test run the mower in a safe area before returning it to service.

CHAPTER 4: WHEELS, NON-DRIVE AXLES AND DOORS

Wheels

Figure 4.1

All of the wheels (drive and non drive) are held on with a nylock lock nut.

To remove/replace the wheel:

1. Lift and safely support the mower.
2. Remove the nut with a 1/2” wrench. See Figure 4.1.
3. Slide the wheel off of the axle.
4. Install the wheel by following the previous steps in reverse order.

NOTE: Apply a small amount of a dry lubricant to the axle shaft before sliding the wheel on.

NOTE: Apply a small amount of releasable thread locking compound such as Loctite® 242 (blue) to the lock nut or replace it with a new one.

NOTE: Tighten the wheel nuts to a torque of 80 - 100 in lbs (9 - 11 Nm)

5. Test run the mower in a safe area before returning it to service.

Non-drive axles

Figure 4.2

All “A” and “B” series mowers have a solid rear axle. Front axles on all “A” and “B” series mowers that are not self propelled are also solid. The height adjuster handle is part of the axle and can not be serviced separately.

To remove/replace the axle:

1. Remove the wheels by following the procedure described in the previous section of this chapter.
2. Gently spread apart the support arms. See Figure 4.2.

NOTE: If a support arm breaks, the entire sub-frame must be replaced.

3. Pull the axle out of the sub-frame.
4. Install the axle by following the previous steps in reverse order.
5. Test run the mower in a safe area before returning it to service.

Trail shield

⚠CAUTION

Never operate a mower without the trail shield. It is a safety feature that is required by law.

The trail shield is designed to drag on the ground behind the mower. This helps keep the operator from getting their feet under the mowing deck.

To remove/replace a trail shield:

1. Grab the trail shield in the middle.
2. Pull back on the trial shield, bending it until it clears the sub frame.
3. Install it by bending it until the pins fit into the sub-frame.
4. Let the trail shield snap into place.
5. Test run the mower in a safe area before returning it to service.

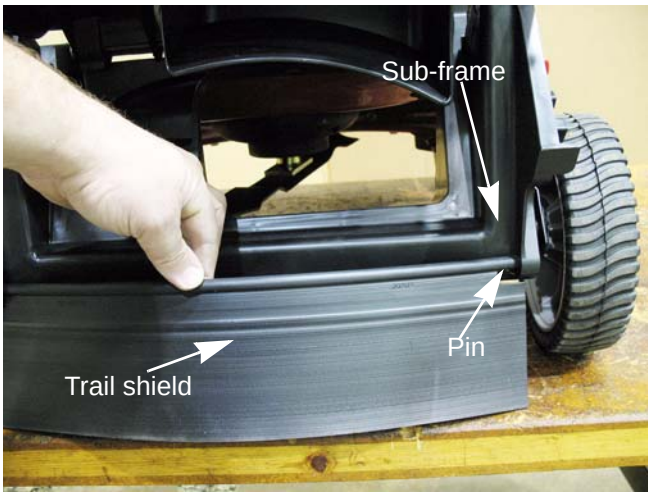

Figure 4.3

Side discharge door

To remove/replace the side discharge/mulching door:

⚠CAUTION

Serious injury from flying debris is possible if the machine is operated with the side discharge door open and the side discharge chute is not in place

1. Disconnect the spark plug wire.
2. Open the side discharge door.
3. Remove the screw that secures the hinge to the mowing deck using a 3/8” wrench.
4. Install by following the previous steps in reverse order.

   NOTE: The hinge is spring loaded. Hold the hinge flat against the deck before starting the screw.
5. Test run the mower in a safe area before returning it to service.

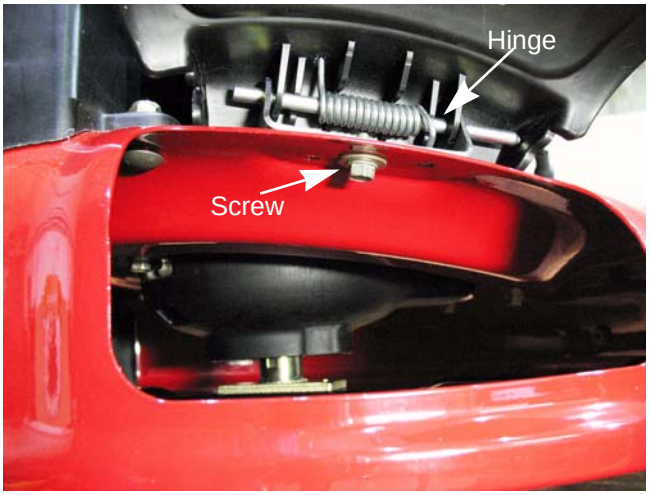

Figure 4.4

Rear discharge door

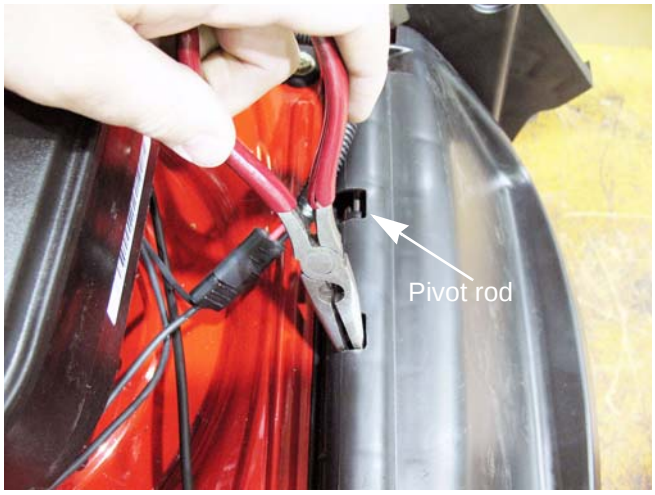

Figure 4.5

To remove/replace the rear discharge door:

1. Remove the rear bagger (if installed).
2. Grab the pivot rod with a pair of needle nose pliers. Slide it to the right (towards the height adjuster). See Figure 4.5.

NOTE: There is a shear load putting tension on the pivot rod. It will take some force to overcome this load.

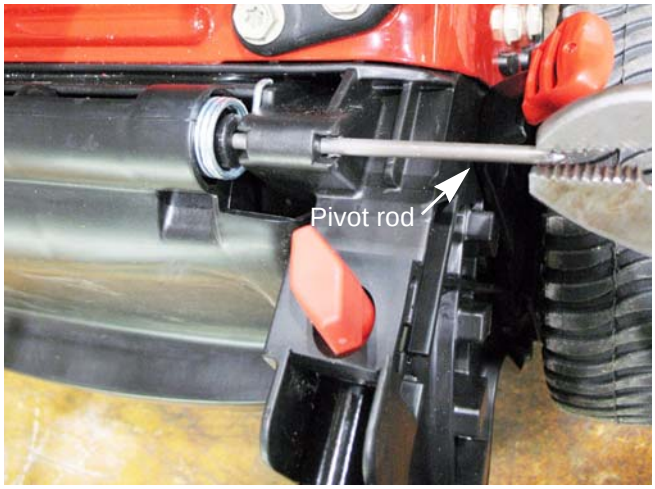

Figure 4.6

3. Once enough of the pivot rod stick out, grab the end of it and pull it all the way out. See Figure 4.6.
4. Lift the door off of the mower.
5. Remove the torsion springs from each side of the door.

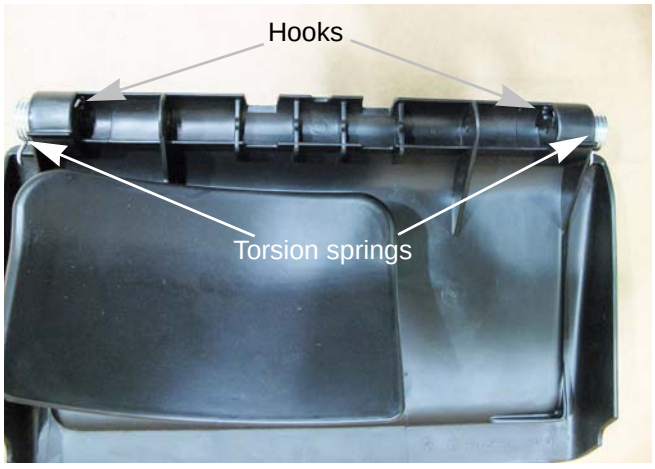

Figure 4.7

6. Install the torsion springs in the new door.

NOTE: The short hook on the end of the spring hooks into the door. See Figure 4.7.

7. Set the door on the rear sub-frame.
8. Hook the end of the left torsion spring onto the rear sub-frame.
9. Press the door down on the right side.
10. Hook the right torsion spring onto the sub frame.

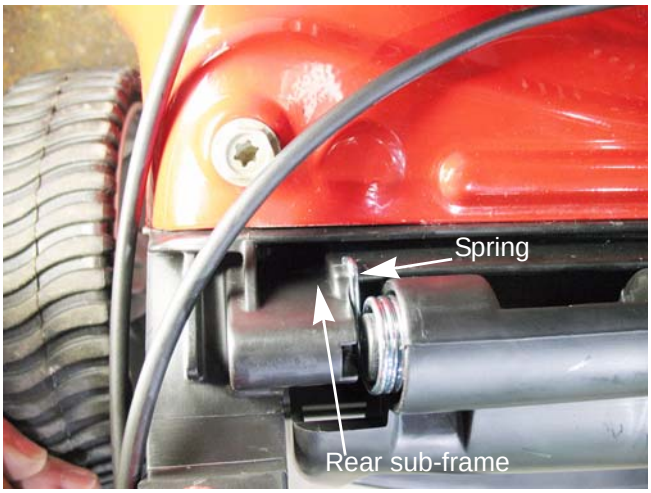

Figure 4.8

11. Insert the pivot rod.

    NOTE: When fully inserted, the end of the pivot rod will be recessed into the hole.

12. Test run the mower in a safe area before returning it to service.

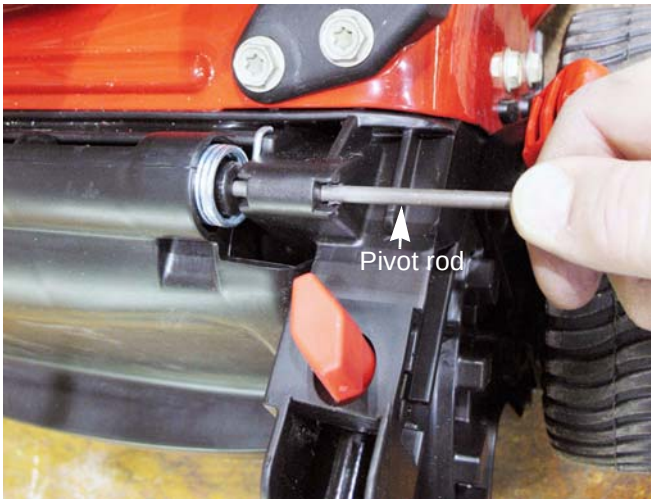

Figure 4.9

CHAPTER 5: TRANSMISSION REMOVAL

To remove/replace the transmission:

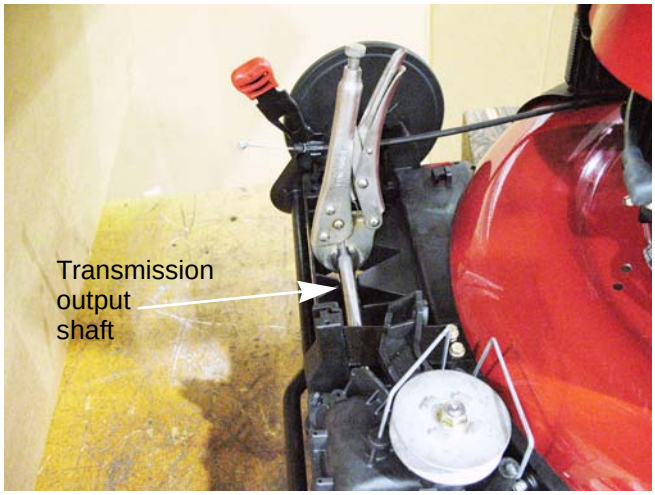

Figure 5.1

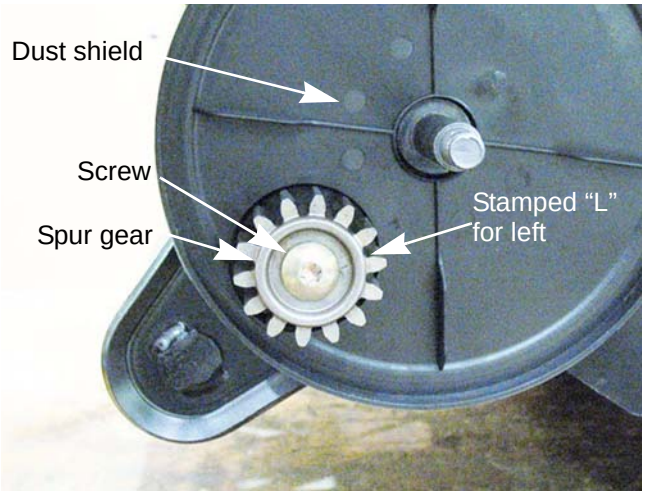

Figure 5.2

1. Remove the blade and belt by following the procedures described in Chapter 2: Blade and Belt.
2. Disconnect the drive control cable from the transmission by following the steps described in Chapter 3: Cables.
3. Remove the drive spur gear.

   3a. Secure the transmission’s output shaft by clamping a pair of vise grips to it. See Figure 5.1.

NOTE: DO NOT engage the drive control bail/lever to keep the transmission output shaft from rotating while installing/removing the screws that secure the spur gears. This practice damages the internal components of the transmission.

   3b. Remove the screw that fastens the spur gear to the end of the transmission output shaft using a T-30 torx driver. See Figure 5.2.

NOTE: DO NOT use an impact driver to remove/install spur gear retaining screws. The excessive torque can over-come the vise grips and damage the transmission’s internal components.

   3c. Remove the spur gear.

NOTE: The left and right spur gears are a mirror image of each other. They are stamped “L” and “R” to identify a left and a right spur gear. If the gears are reversed, the wheels will not drive forward and they will lock up when pulled in reverse.

3d. Remove the dowel pin that drives the spur gear. See Figure 5.3.

NOTE: There is a lip on one end of the dowel pin. The pin must be removed from that end.

4. Remove the dust shield.

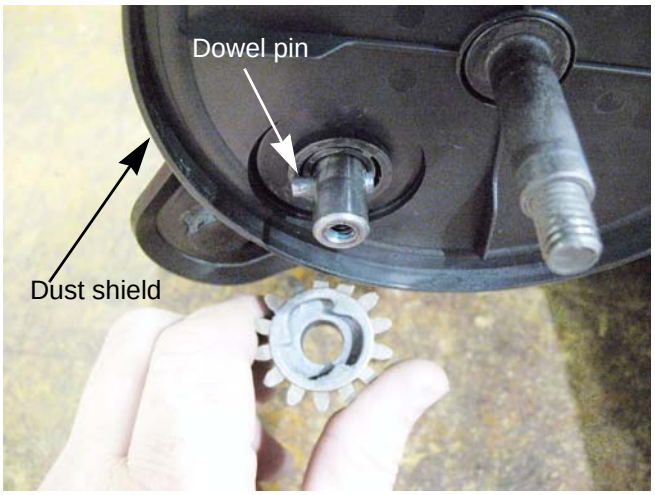

Figure 5.3

5. Remove the transmission stop using a 5/16" wrench. See Figure 5.4.

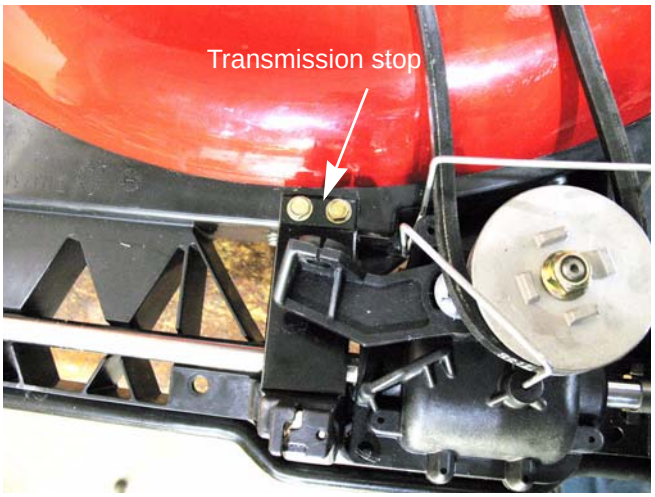

Figure 5.4

6. There are two retaining clips that hold the transmission to the front sub-frame. Squeeze these clips below the transmission output shaft while lifting the transmission out of the machine. See Figure 5.5.

NOTE: The front axle assembly will come off with the transmission.

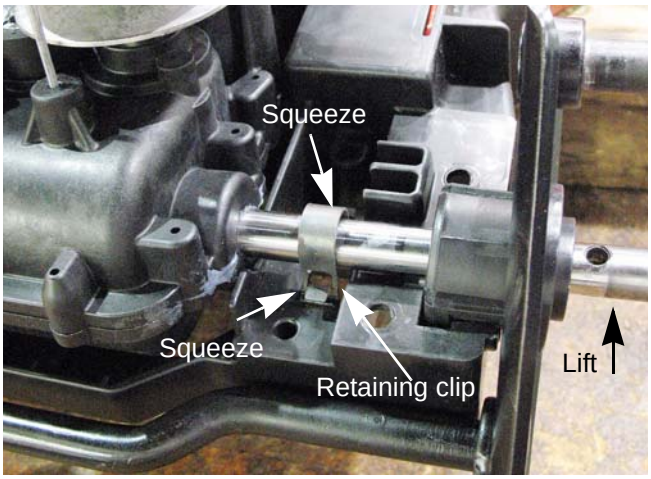

Figure 5.5

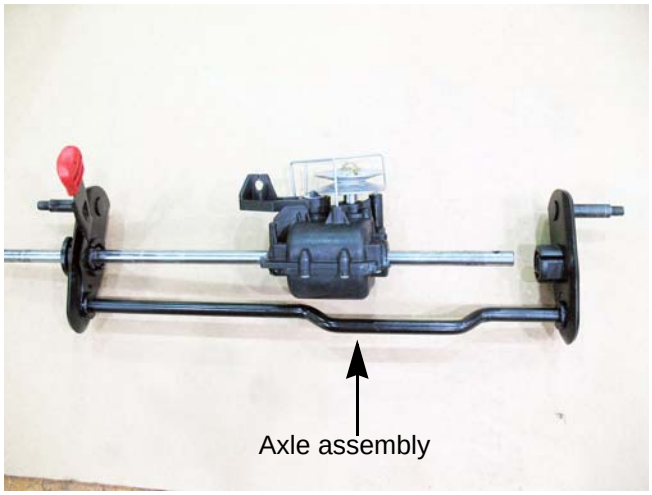

Figure 5.6

7. Slide the longer end of the transmission output shaft through the shaft support of the axle. When the shorter end of the shaft clears the second shaft support, remove the transmission from the axle. See Figure 5.6.
8. Install the transmission by following the previous steps in reverse order.

NOTE: Apply a small amount of releasable thread locking compound such as Loctite® 242 (blue) to the wheel nut or replace it with a new one.

NOTE: Tighten the wheel nuts to a torque of 80 - 100 in lbs (9 - 11 Nm)

9. Test run the mower before returning it to service.

Drive bushings

To remove/replace the drive bushings:

1. Disconnect and ground the spark plug wire.
2. Drain the fuel into an approved container.
3. Tip the mower with the muffler side down, or tilt the mower back on a work bench, with the front wheels up.
4. Remove the belt cover by following the steps described in Chapter 2: Blade and Belt.
5. Set the mower down on a couple of wooden blocks.
6. Remove the drive spur gear.

   6a. Secure the transmission's output shaft by clamping a pair of vise grips to it. See Figure 5.7.

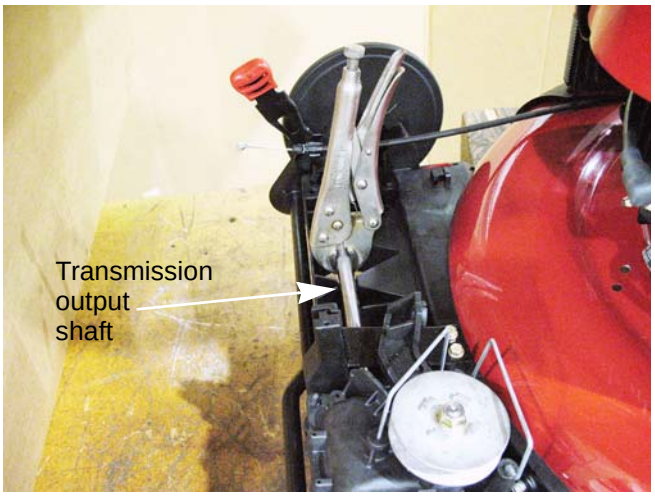

Figure 5.7

NOTE: DO NOT engage the drive control bail/lever to keep the transmission output shaft from rotating while installing/removing the screws that secure the spur gears. This will damage the transmission internally.

7. Remove the screw that holds the spur gear to the end of the transmission output shaft using a T-30 torx driver. See Figure 5.8.

   NOTE: DO NOT use an impact driver to remove/install spur gear retaining screws. The excessive torque can over-come the vise grips and damage the transmission's internal components.

8. Remove the spur gear.

   NOTE: The left and right spur gears are a mirror image of each other. They are stamped "L" and "R" to identify a left and a right spur gear. If the gears are reversed, the wheels will not drive forward and they will lock up when pulled in reverse.

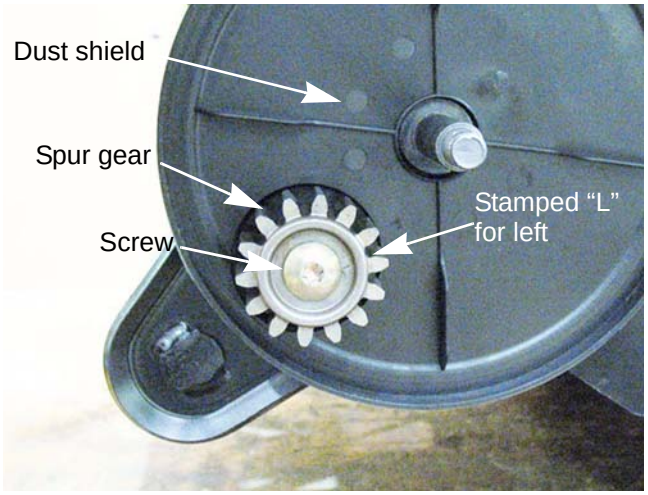

Figure 5.8

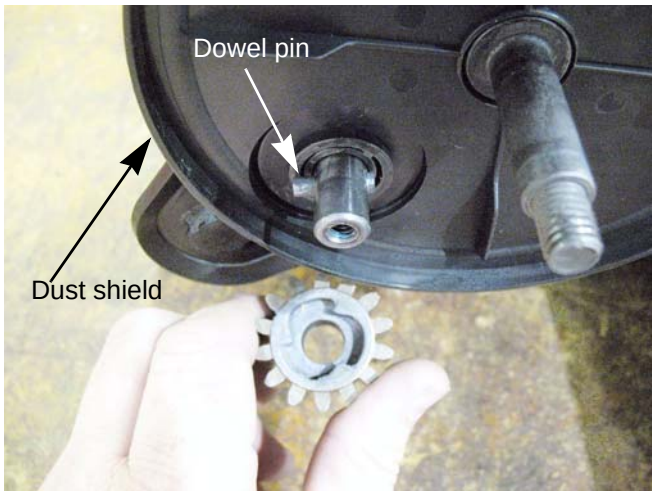

Figure 5.9

8a. Remove the dowel pin that drives the spur gear. See Figure 5.9.

NOTE: There is a lip on one end of the dowel pin. The pin must be removed from that end.

8b. Remove the dust shield.

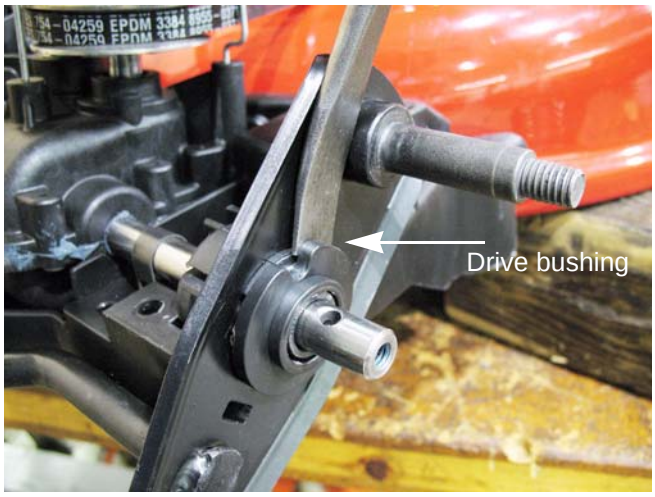

Figure 5.10

9. Pry out the drive bushings. See Figure 5.10.

10. Install new bushings by following the previous steps in reverse order.

NOTE: Apply a small amount of a dry lubricant to the axle shaft before installing the spur gear.

NOTE: Apply a small amount of releasable thread locking compound such as Loctite® 242 (blue) to the wheel nut or replace it with a new one.

NOTE: Tighten the wheel nuts to a torque of 80 - 100 in lbs (9 - 11 Nm)

11. Test run the mower before returning it to service.

CHAPTER 6: ELECTRIC START

Some model of the “A” and “B” series mower have an electric start engine. The starter and the pigtail connector are part of the engine. See the engine manufacturer service information on those components. The battery, key switch and the harness going to the engine will be covered in this chapter.

Battery

Figure 6.1

The battery used on the “A” and “B” series mower is a:

- Sealed, maintenance free lead-acid battery
- 12 volts
- 4.0 amp-hours

⚠CAUTION Only use the charger that was supplied with the mower to charge the battery. Use of an automotive battery charger may cause damage to the battery. Over charging from automotive charger can cause acid to leak from the battery.

Figure 6.2

IMPORTANT: Never use a fix load battery test on these batteries. The current draw will cook the batteries and damage them. See Figure 6.2.

Battery testing

To load test a battery:

1. Fully charge the battery (24 hour charge).
2. Move the mower to a safe area.
3. Take the cover off of the battery box. See Figure 6.3.
4. Disconnect the spark plug wire.

   NOTE: Do not remove the spark plug.

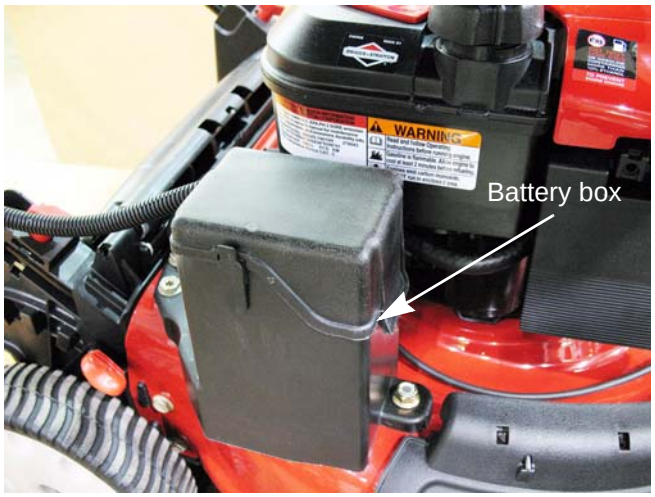

Figure 6.3

5. Attach a digital multi-meter (DMM) to the battery posts. See Figure 6.4.
6. Set the DMM to the volts DC scale.
7. Attach an inductive amp meter (amp clamp) to the negative battery wire.

   NOTE: If you have a negative measurement, the meter was connected backwards. Just ignore the minus sign.

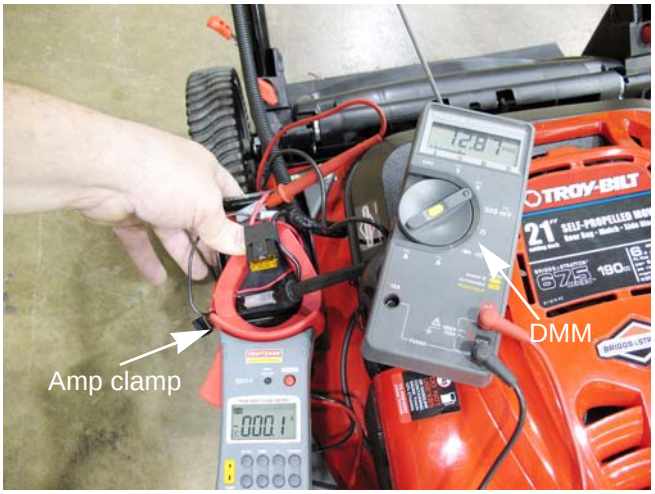

Figure 6.4

8. Turn the ignition key to crank the engine for 10 seconds.

   NOTE: While the engine is cranking, read the voltage on the DMM and the current draw on the amp clamp.

   NOTE: DO not crank the engine for more than 30 seconds at a time.
9. If the battery voltage drops below 7.5 volts and the current draw is less than 110% of the starters rated current draw (from the engine manufacturer) , the battery is bad.

   NOTE: If the current draw is more than 110% of the starters rated current draw, there is either a short in the system or the starter is pulling too much current.

Figure 6.5

Battery removal

Figure 6.6

To remove/replace the battery:

1. Take the cover off of the battery box. See Figure 6.6.

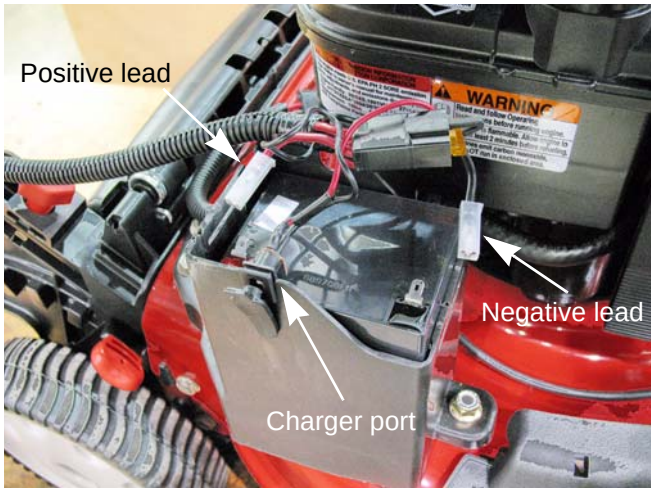

Figure 6.7

2. Disconnect positive and negative battery leads. See Figure 6.7.
3. Slide the charger port out of the battery box.
4. Lift the harness out of the way.

⚠CAUTION Do not short the battery terminals.

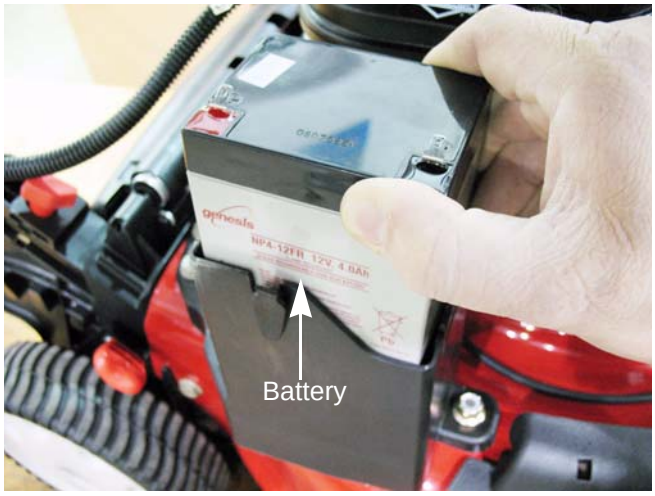

Figure 6.8

5. Lift the battery out of the battery box.
6. Install the battery by following the previous steps in reverse order.
7. Test run the mower by following the previous steps in reverse order.

Fuse

The “A” and “B” series mowers with electric start are equipped with a 40 amp ATO automotive blade type fuse.

The fuse is located in the battery box, on top of the battery. See Figure 6.9.

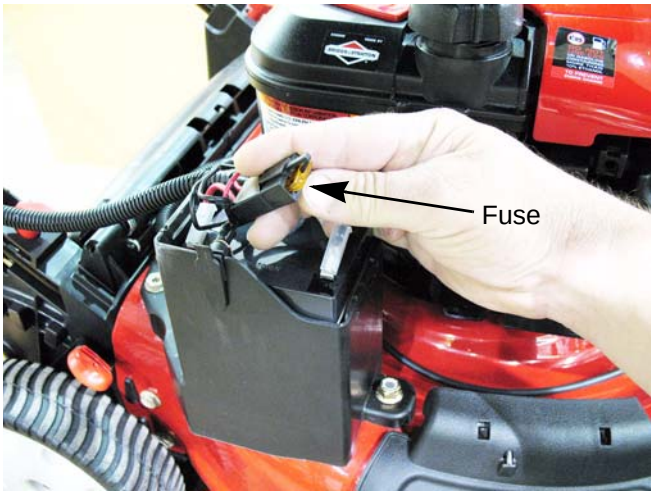

Figure 6.9

Key switch

The key switch used on “A” and “B” series mowers is a normally open (NO) momentary switch. This means that the contacts inside the switch are open until the key is turned (NO). Turning the key will close the contacts. As soon as the key is released the contacts will open (momentary switch).

To remove/replace the key switch:

1. Remove the key switch retaining nut. See Figure 6.10.
2. Pull the key switch out of the mounting bracket by the harness.

   NOTE: There is an internal star washer that should come out with the key switch.

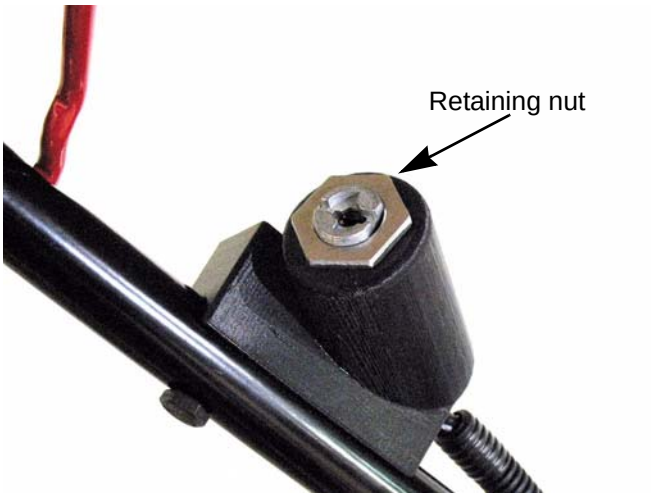

Figure 6.10

3. Unplug the wires going to the switch. See Figure 6.11.
4. Install the key switch by following the previous steps in reverse order.
5. Test drive the mower before returning it to service.

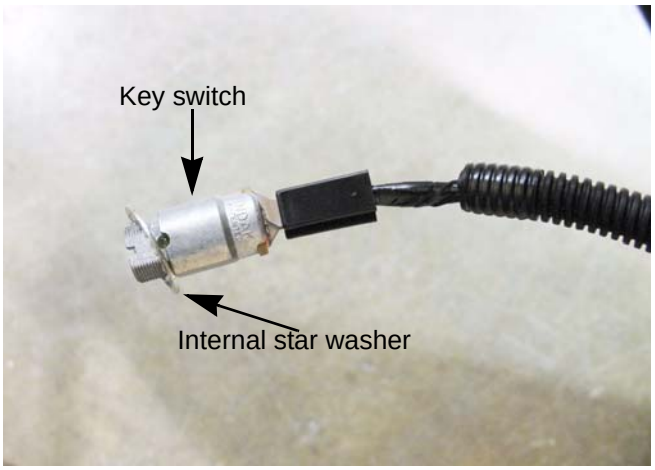

Figure 6.11

Wiring harness

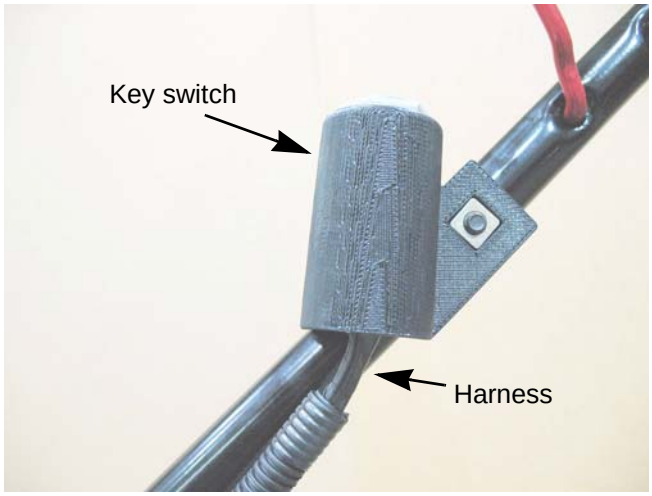

Figure 6.12

To remove/replace the harness:

1. Disconnect the harness from the key switch.

NOTE: The harness is a tight fit. It may be necessary to remove the key switch to get enough leverage to unplug it.

2. Cut off the wire ties that hold the harness to the handle bars.

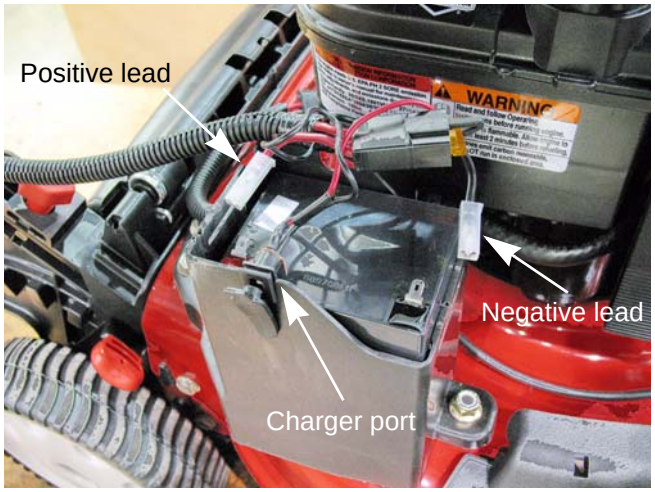

Figure 6.13

3. Remove the battery box cover.
4. Disconnect positive and negative battery leads. See Figure 6.13.
5. Slide the charger port out of the battery box.
6. Lift the harness out of the battery box.

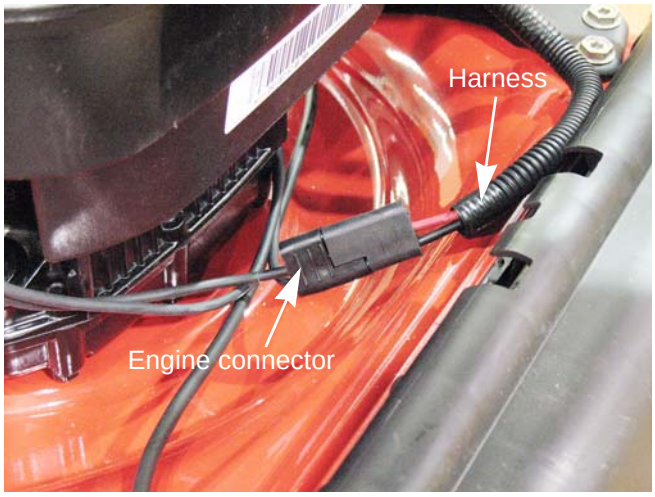

Figure 6.14

7. Disconnect the harness from the engine connector. See Figure 6.14.
8. Install the harness by following the previous steps in reverse order.

NOTE: Use new wire ties to secure the harness to the handle bars.

9. Test run the mower in a safe area before returning it to service.

Schematic

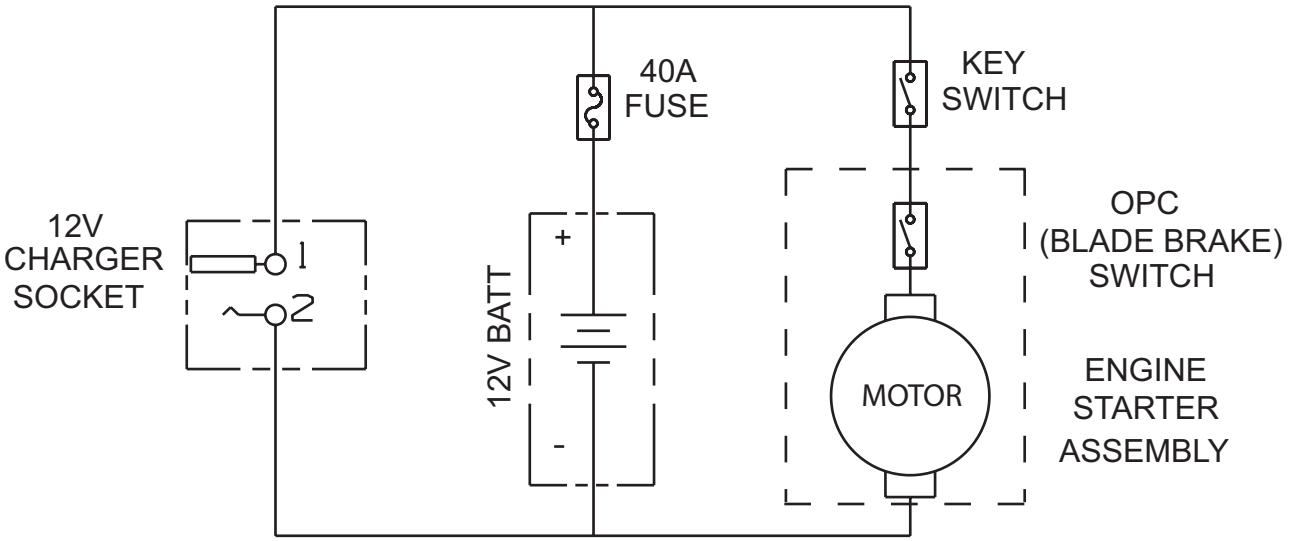

Figure 6.15